

CLAIMS

What is claimed is:

1. A transparent, paramagnetic polymer composition comprising a non-ethylene containing polymer complexed with a sufficient amount of one or more rare earth ions selected from the group consisting of elements 64 – 69 to provide a polymer composition magnetic mass susceptibility of greater than  $20 \times 10^{-6}$  emu/g measured at 298°K.
- 10 2. The transparent, paramagnetic polymer composition of claim 1 wherein the non-ethylene containing polymer is a fluoropolymer with sulfonic or carboxylic acid functionality.
- 15 3. The transparent, paramagnetic polymer composition of claim 1 wherein the non-ethylene containing polymer is an acrylic polymer formed from the polymerization of at least one acrylate or acrylic acid.
- 20 4. The transparent, paramagnetic polymer composition of claim 3 wherein the transparent, paramagnetic polymer composition additionally comprises a short-chain fatty acid of the formula  $R_1COOH$  wherein  $R_1$  is selected from the group consisting of  $C_5 - C_{30}$ .
- 25 5. The transparent, paramagnetic polymer composition of claim 3 wherein the acrylate is methyl methacrylate and the acrylic acid is methacrylic acid.
6. The transparent, paramagnetic polymer composition of claim 4 wherein the acrylate is methyl methacrylate, the acrylic acid is methacrylic acid, and the short chain fatty acid is oleic acid.
- 30 7. A transparent, paramagnetic polymer composition comprising a non-ethylene containing polymer complexed with one or more rare earth ions selected from the group consisting of elements 64 – 69, the amount of rare earth ions being greater than 9 weight percent based on the total weight of the transparent, paramagnetic polymer.
- 35 8. The transparent, paramagnetic polymer composition of claim 7 wherein the non-ethylene containing polymer is a fluoropolymer with sulfonic or carboxylic acid functionality.

- 5    9. The transparent, paramagnetic polymer composition of claim 7 wherein the non-ethylene containing polymer is an acrylic polymer formed from the polymerization of at least one acrylate or acrylic acid.
- 10    10. The transparent, paramagnetic polymer composition of claim 9 wherein the transparent, paramagnetic polymer composition additionally comprises a short-chain fatty acid of the formula  $R_1COOH$  wherein  $R_1$  is selected from the group consisting of  $C_5 - C_{30}$ .
- 10    11. The transparent, paramagnetic polymer composition of claim 9 wherein the acrylate is methyl methacrylate and the acrylic acid is methacrylic acid.
- 15    12. The transparent, paramagnetic polymer composition of claim 10 wherein the acrylate is methyl methacrylate, the acrylic acid is methacrylic acid, and the short chain fatty acid is oleic acid.
- 20    13. A transparent, paramagnetic polymer composition comprising a non-ethylene containing polymer complexed with one or more rare earth ions selected from the group consisting of elements 66 – 67, the amount of rare earth ions being greater than 5 weight percent based on the total weight of the transparent, paramagnetic polymer.
- 25    14. The transparent, paramagnetic polymer composition of claim 13 wherein the non-ethylene containing polymer is a fluoropolymer with sulfonic or carboxylic acid functionality.
- 25    15. The transparent, paramagnetic polymer composition of claim 13 wherein the non-ethylene containing polymer is an acrylic polymer formed from the polymerization of at least one acrylate or acrylic acid.
- 30    16. The transparent, paramagnetic polymer composition of claim 15 wherein the transparent, paramagnetic polymer composition additionally comprises a short-chain fatty acid of the formula  $R_1COOH$  wherein  $R_1$  is selected from the group consisting of  $C_5 - C_{30}$ .
- 35    17. The transparent, paramagnetic polymer composition of claim 15 wherein the acrylate is methyl methacrylate and the acrylic acid is methacrylic acid.
- 35    18. The transparent, paramagnetic polymer composition of claim 16 wherein the acrylate is methyl methacrylate, the acrylic acid is methacrylic acid, and the short chain fatty acid is oleic acid.